



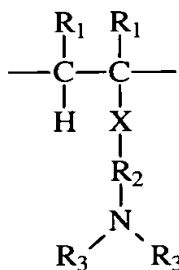
## WHAT IS CLAIMED IS:

1. A laundry additive article effective for selectively absorbing and inhibiting transfer of extraneous dyes in a wash solution, said article comprising:
  - a) an insoluble substrate for introduction into a wash solution;
  - b) a dye absorber comprising a substantially insoluble polymeric amine fixably adhered to said substrate;
  - c) optionally, a dye transfer inhibitor releasably associated with said substrate.
2. The laundry additive article of Claim 1 wherein said dye absorber is selected from the group consisting of  
cross-linked amine polymers formed by copolymerizing vinyl or acrylic type monomers having an amine group with a monomer having a group capable of forming branches and cross-linked amine polymers formed by cross-linking soluble amine-containing molecules  
with reactive cross-linking agents.
3. The laundry additive article of Claim 1 wherein said dye absorber is formed by copolymerizing:
  - a) a bifunctional vinyl or acrylic type monomer having an amine group; with
  - b) a monomer having a group capable of forming branches or cross-links; wherein said monomer having a group capable of forming branches or cross-links is selected from the group consisting of trifunctional vinyl compounds, polyfunctional vinyl compounds, trifunctional acrylic compounds, polyfunctional acrylic compounds and mixtures thereof.
4. The laundry additive of Claim 3, wherein said monomer having a group capable of forming branches or cross-links is further selected from the group consisting of

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divinyl benzene, divinyladipate, butanediol-1,4-diacrylate, divinylimidazolidone-2, and mixtures thereof.

5. The laundry additive article of Claim 1 wherein said dye absorber is selected from the group consisting of cross-linked polyvinyl pyrrolidone, cross-linked polyvinyl pyridine and its derivatives, cross-linked polyamine-N-oxide, cross-linked polymers containing the monomer unit



and monomer units from other suitable copolymerizable monoethylenically unsaturated monomers, wherein:

R<sub>1</sub> is selected from the group consisting of H, C<sub>1</sub>-C<sub>4</sub> alkyl and mixtures thereof;

R<sub>2</sub> is selected from the group consisting of C<sub>2</sub>-C<sub>6</sub> alkylene, hydroxyalkylene, and mixtures thereof;

R<sub>3</sub> is selected from the group consisting of H, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>7</sub>-C<sub>9</sub> alkylaryl, C<sub>2</sub>-C<sub>4</sub> hydroxyalkylaryl, and mixtures thereof; and

X is selected from the group consisting of  $\begin{array}{c} \text{O} \\ || \\ -\text{C}-\text{O}- \end{array}$ ,  $\begin{array}{c} \text{O} \\ || \\ -\text{C}-\text{NH}- \end{array}$  and mixtures thereof;

cross-linked polymers comprised of the monomer unit

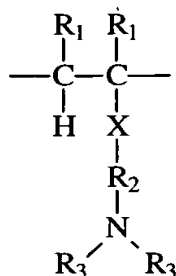
and monomer units produced from other suitable copolymerizable monoethylenically unsaturated monomers wherein:

c = 1; and

R<sub>4</sub> is selected from the group consisting of H, C<sub>1</sub>-C<sub>4</sub> alkyl, hydroxyalkyl, and mixtures thereof; and mixtures thereof.

6. The laundry additive article of Claim 1 wherein said dye absorber is formed by cross-linking water-soluble polyamines with a suitable cross-linking agent, wherein said polyamine is selected from the group consisting of polymers, oligomers, prepolymers, and mixtures thereof, having functional groups selected from the group consisting of hydroxyl, amine, ester, ketone, amide, isocyanate, and mixtures thereof.
7. The laundry additive article of Claim 6 wherein said cross-linking agent is selected from the group consisting of epihalohydrins, bishalohydrins of diols, bishalohydrins of polyalkylene glycols, bishalohydrins of polytetrahydrofurans, alkylene dihalides, alkylene trihalides, bisepoxides, trisepoxides, tetraepoxides, and mixtures thereof.
8. The laundry additive article of Claim 6 wherein said water-soluble polyamines are formed by  
reacting:
- a) condensates of soluble amines selected from the group consisting of linear alkylamines, branched alkylamines, cycloalkylamines, alkoxyamines, amino acids, cyclic amines containing at least one nitrogen atom in a ring structure, alkenediamines, polyetherdiamines, polyalkylenepolyamines, mixtures of an amine with at least one amino acid, or mixtures thereof; with
  - b) a cross-linking agent selected from the group consisting of epihalohydrins, bishalohydrins of diols, bishalohydrins of polyalkylene glycols; bishalohydrins of polytetrahydrofuran; alkylene dihalides, alkylene trihalides, bisepoxides, trisepoxides, tetraepoxides, and mixtures thereof.

9. The laundry additive article of Claim 6 wherein said water-soluble polyamine is selected from the group consisting of homopolymers, copolymers, or terpolymers of vinyl pyrrolidone; homopolymers, copolymers, or terpolymers of polyvinyl pyridine and its derivatives; homopolymers, copolymers, or terpolymers containing the



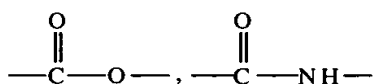
monomer unit

and monomer units from other suitable copolymerizable monoethylenically unsaturated monomers, wherein:

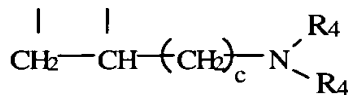
$R_1$  is selected from the group consisting of H, methyl, and mixtures thereof;

$R_2$  is selected from the group consisting of  $C_2$ - $C_6$  alkylene, hydroxyalkylene, and mixtures thereof;

$R_3$  is selected from the group consisting of H,  $C_1$ - $C_4$  alkyl,  $C_7$ - $C_9$  alkylaryl,  $C_2$ - $C_4$  hydroxyalkyl and mixtures thereof; and



$X$  is selected from the group consisting of and mixtures thereof; homopolymers,



copolymers, or terpolymers comprised of the monomer unit

and monomer units produced from other monoethylenically unsaturated monomers, wherein:

$c=1$ ; and

R<sub>4</sub> is selected from the group consisting of H, C<sub>1</sub>-C<sub>4</sub> alkyl, hydroxyalkyl, and mixtures thereof;  
and mixtures thereof.

10. The laundry additive article of Claim 1 wherein said dye absorber is fixably adhered to said substrate by copolymerizing and cross-linking said polymeric amines in the presence of said substrate, wherein said dye absorber forms an insoluble polymer network on said substrate.
11. The laundry additive article of Claim 1 wherein said dye absorber is fixably adhered to said substrate by cross-linking said polymeric amines in the presence of said substrate, wherein said dye absorber forms an insoluble polymer network on said substrate.
12. The laundry additive article of Claim 1 wherein said dye absorber is fixably adhered to said substrate by physical means or by grafting said dye absorber to said substrate using physical, chemical, thermal, ultraviolet, or other suitable grafting techniques or by forming a cross-linked network of said dye absorber within said substrate.
13. A method of making a laundry additive article effective for selectively absorbing and inhibiting transfer of extraneous dyes in a wash solution, said method comprising the steps of:
  - a) selecting an insoluble substrate capable of retaining a fixed dye absorber and optionally, releasing a dye transfer inhibitor into a wash solution;
  - b) fixably adhering an absorbing effective amount of a substantially insoluble polymeric amine dye absorber; and
  - c) optionally, introducing a dye transfer inhibitor to said insoluble substrate;wherein said dye absorber and said optional dye transfer inhibitor are simultaneously or sequentially introduced to said insoluble substrate.

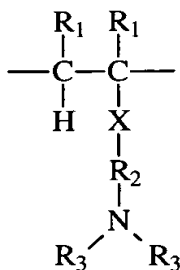
14. The method of Claim 13 wherein said substantially insoluble polymeric amine is selected from the group consisting of cross-linked amine polymers formed by copolymerizing vinyl or acrylic type monomers having an amine group with a monomer having a group capable of forming branches and cross-linked amine polymers formed by cross-linking soluble amine-containing molecules with reactive cross-linking agents.

15. The method of Claim 13 wherein said dye absorber is formed by copolymerizing:

- a) a bifunctional vinyl or acrylic type monomer having an amine group; with
- b) a monomer having a group capable of forming branches or cross-links, wherein said monomer having a group capable of forming branches or cross-links is selected from the group consisting of trifunctional vinyl compounds, polyfunctional vinyl compounds, trifunctional acrylic compounds, and polyfunctional acrylic compounds.

16. The method of Claim 15, wherein said monomer having a group capable of forming branches or cross-links is further selected from the group consisting of divinyl benzene, divinyladipate, butanediol-1,4-diacrylate, divinylimidazolidone-2, and mixtures thereof.

17. The method of Claim 13, wherein said dye absorber is selected from the group consisting of cross-linked polyvinyl pyrrolidone, cross-linked polyvinyl pyridine and its derivatives, cross-linked polyamine-N-oxide, cross-linked polymers containing the



monomer unit

and monomer units from other suitable copolymerizable monoethylenically unsaturated monomers, wherein:

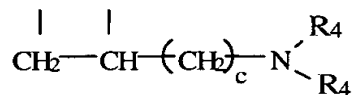
$R_1$  is selected from the group consisting of H,  $C_1$ - $C_4$  alkyl and mixtures thereof;

$R_2$  is selected from the group consisting of  $C_2$ - $C_6$  alkylene, hydroxyalkylene, and mixtures thereof;

$R_3$  is selected from the group consisting of H,  $C_1$ - $C_4$  alkyl,  $C_7$ - $C_9$  alkylaryl,  $C_2$ - $C_4$  hydroxyalkylaryl, and mixtures thereof; and

X is selected from the group consisting of  $\text{—}\overset{\text{O}}{\parallel}\text{C—O—}$ ,  $\text{—}\overset{\text{O}}{\parallel}\text{C—NH—}$  and mixtures thereof;

cross-linked polymers comprised of the monomer unit



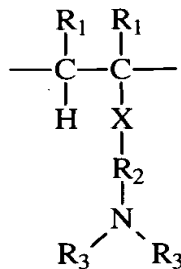
and monomer units produced from other suitable copolymerizable monoethylenically unsaturated monomers wherein:

$c = 1$ ; and

$R_4$  is selected from the group consisting of H,  $C_1$ - $C_4$  alkyl, hydroxyalkyl, and mixtures thereof;  
and mixtures thereof.

18. The method of Claim 13 wherein said dye absorber is formed by cross-linking water-soluble polyamines with a suitable cross-linking agent wherein said polyamine is selected from the group consisting of polymers, oligomers, prepolymers, and mixtures thereof, having functional groups selected from the group consisting of hydroxyl, amine, ester, ketone, amide, isocyanate, and mixtures thereof.

19. The method of Claim 18 wherein said cross-linking agent is selected from the group consisting of epihalohydrins, bishalohydrins of diols, bishalohydrins of polyalkylene glycols, bishalohydrins of polytetrahydrofurans alkylene dihalides, alkylene trihalides, bisepoxides, trisepoxides, tetraepoxides, and mixtures thereof.
20. The method of Claim 18 wherein said water-soluble polyamines are formed by reacting:
- condensates of soluble amines selected from the group consisting of linear alkylamines, branched alkylamines, cycloalkylamines, alkoxyamines, amino acids, cyclic amines containing at least one nitrogen atom in a ring structure, alkenediamines, polyetherdiamines, polyalkylenepolyamines, mixtures of an amine with at least one amino acid, or mixtures thereof; with
  - a cross-linking agent selected from the group consisting of epihalohydrins, bishalohydrins of diols, bishalohydrins of polyalkylene glycols; bishalohydrins of polytetrahydrofuran; alkylene dihalides, alkylene trihalides, bisepoxides, trisepoxides, tetraepoxides, and mixtures thereof.
21. The method of Claim 18 wherein said water-soluble polyamine is selected from the group consisting of homopolymers, copolymers, or terpolymers of vinyl pyrrolidone; homopolymers, copolymers, or terpolymers of polyvinyl pyridine and its derivatives; homopolymers, copolymers, or terpolymers containing the monomer unit



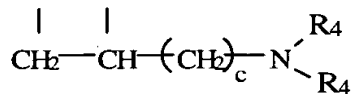
and monomer units from other suitable copolymerizable monoethylenically unsaturated monomers, wherein:

R<sub>1</sub> is selected from the group consisting of H, methyl, and mixtures thereof;

R<sub>2</sub> is selected from the group consisting of C<sub>2</sub>-C<sub>6</sub> alkylene, hydroxyalkylene, and mixtures thereof;

R<sub>3</sub> is selected from the group consisting of H, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>7</sub>-C<sub>9</sub> alkylaryl, C<sub>2</sub>-C<sub>4</sub> hydroxyalkyl and mixtures thereof; and

X is selected from the group consisting of  $\text{—}\overset{\text{O}}{\parallel}\text{C—O—}$ ,  $\text{—}\overset{\text{O}}{\parallel}\text{C—NH—}$  and mixtures thereof; homopolymers, copolymers, or terpolymers comprised of the monomer unit



and monomer units produced from other monoethylenically unsaturated monomers, wherein:

c=1; and

R<sub>4</sub> is selected from the group consisting of H, C<sub>1</sub>-C<sub>4</sub> alkyl, hydroxyalkyl, and mixtures thereof;

and mixtures thereof.

22. The method of Claim 13 wherein said dye absorber is fixably adhered to said substrate by copolymerizing and cross-linking said dye absorber in the presence of said substrate, wherein said dye absorber forms an insoluble polymer network on said substrate.

23. The method of Claim 13 wherein said dye absorber is fixably adhered to said substrate by cross-linking said dye absorber in the presence of said substrate, wherein said dye absorber forms an insoluble polymer network on said substrate.

24. The method of Claim 13 wherein said dye absorber is fixably adhered to said substrate by physical means or by grafting said dye absorber to said substrate using physical, chemical, thermal, ultraviolet, or other suitable grafting techniques or by forming a cross-linked network of said dye absorber within said substrate.

25. A method for preventing transfer of extraneous dyes in a wash solution comprising the steps:

- a) adding to said wash solution a cleaning effective amount of detergent;
- b) adding to said wash solution a laundry additive article designed for selectively absorbing and inhibiting transfer of extraneous dyes in a wash solution before or after addition of articles and/or garments; said article comprising:
  - (i) an insoluble substrate;
  - (ii) a dye absorber comprising a substantially insoluble polymeric amine fixably adhered to said substrate; and
  - (iii) optionally, a dye transfer inhibitor releasably associated with said substrate;
- c) leaving said laundry additive article in contact with said wash solution during an entire laundering cycle; and
- d) optionally, leaving said laundry additive article with said articles and/or garments when they are placed in a clothes dryer.